

February 25, 2005

Mr. Roberto Fonseca-Martinez
Division Administrator
Virginia Division, Federal Highway Administration
US Department of Transportation
Richmond, Virginia

RE: High Occupancy Vehicle Lanes letter of December 08, 2004

Dear Mr. Fonseca-Martinez

This letter is in response to your December 8, 2004 letter regarding High Occupancy Vehicle (HOV) Lanes and Clean Fuel Vehicles on Interstates 95/395 in Northern Virginia. VDOT appreciates the shared concerns over the issues of operations on HOV lanes, in general, and the use HOV lanes by clean fuel vehicles, in particular. VDOT shares FHWA sentiments that we should continue to improve services to our customers on some of the most effective HOV facilities in the country.

VDOT has taken a number of steps in evaluating and implementing measures to address these concerns over the last year. These steps include evaluating and improving the Smart Traffic Center's ability to detect incidents and improve our incident management response times. Also, NOVA District is currently in the process of realigning its District Maintenance and Operations section to focus on establishing and implementing an integrated traffic management program to ensure safe roadway operation, efficient traffic flow, effective incident management, and meaningful information to the traveling public.

Most recently, VDOT conducted a preliminary traffic study over the last two months using traffic data collected by Washington Council of Governments (COG) in Fall 2004 supplemented by additional data collected by VDOT in December 2004 and January 2005. The study focused on identifying the most recent problem areas and causes of deterioration of travel times in the HOV lanes. This effort led to conceptualizing mitigation measures and assessing their effectiveness. A presentation of these findings in a slide-show format is being submitted as an attachment to this letter.

Problem Statement

Overall vehicular demand for the I-95/395 HOV facility has been growing at an accelerated rate over the past two to three years. Total traffic volumes during three hour AM HOV restricted period (6:00 – 9:00 AM) on I-95 HOV lanes at Occoquan river crossing has increased from about 5,855 vehicles in Fall 2002 to about 7,680 vehicles in Fall 2004—about 31 percent increase in two years. High volumes in both HOV and Non-HOV lanes mean the facilities are reaching their maximum capacity to move traffic. Capacity is compromised by other factors, including high violation rates in the HOV lanes from 6:00 AM to 6:30 AM, sharp increases in the exempt hybrid vehicles, geometric conditions, downstream constraints, variations with the weather and incidents, and rubbernecking. The result is an overall degrading of traffic operations. The deterioration in operations is reaching the point where travel times and speeds are being adversely impacted on HOV lanes. Attached Figure 1 shows growth patterns over last three years.

Since 2000, hybrid vehicles have been allowed to travel on HOV lanes without meeting the HOV3+ occupancy criteria. Registered Clean Fuel (CF) vehicles have increased significantly in a short period of time. Ninety seven percent (97%) of active CF registrations in the Northern Virginia jurisdictions of Alexandria, Fairfax City, Manassas, Manassas Park, Arlington, Fairfax County, Loudoun, Prince William and Stafford are hybrid vehicles. These registrations have grown from approximately 4,800 in October 2004 to approximately 6,900 active CF registrations of hybrid vehicles—a 44% increase (2,100 vehicles) in less than four months.

Shoulder periods of the HOV restricted periods have historically shown high volume levels attributed to violators. Specifically, there are a large number of violators on the HOV lanes between 6:00 and 6:30 AM. In many cases, these are low occupant vehicles that have entered the HOV lanes prior to the restricted period but have not exited the HOV facility as they are compelled to by law. This, in turn, causes legitimate HOV users to delay their entry onto the HOV facility so as to avoid the congested conditions in the first half-hour of the HOV restricted period. Attached figures 2, 3, and 4 depict this trend. Especially, note the high number of “violators” within each distribution as compared to existing CF vehicles.

Traffic demands during AM restricted periods (6:00-9:00 AM) vary through the 30-mile corridor. On the I-95 portion (Outside Beltway), demands are higher during 6:00 to 7:30 AM. On I-395 portion (Inside Beltway), demands are higher after 7:30 AM. Attached figures 2, 3, and 4 show these traffic distribution patterns. Total traffic volumes on HOV lanes have been observed to vary significantly by day of week. Extraneous factors such as weather and incidents also have significant impacts HOV lane traffic flow

As for the traffic operational problems related to specific bottlenecks, two distinct types of problems have been identified:

- Momentary slowdowns that dissipate relatively quickly in several locations such as the Horner Road/PW Parkway ramp merge and the Newington flyover ramp exit.
- Backups/Spillbacks that cause longer congestion, such as, queue spillbacks from Eads St exit ramp to Pentagon and Washington Blvd exit ramp.

Actions Taken To Date By Virginia

- HOV Enforcement Task Force Recommendations
 - All new hybrid vehicles beginning with model year 2005 and later will be subject to California's Super Ultra-Low Emission Vehicle (SULEV) assessment standards – See Attachment from DMV/DEQ findings on hybrids
 - Increased funding by VDOT for enhanced enforcement by State Police – up \$250,000, from \$150,000 to \$400,000
- New legislation now in effect to improve enforcement (July 1, 2004)
 - Doubled fines for violators, as well as
 - Added Driver Demerit Points for “moving violations” for repeat violators.

Proposed Actions for Continuous Monitoring and Evaluation of Operations

VDOT has identified and is planning a variety of actions to implement a continuous monitoring and evaluation of the NOVA system's operations. Efforts are underway to better utilize existing data gathering and analysis capabilities for this purpose. Data from over 130 detectors has been collected in archived files over past two years. The development of user-friendly reporting of the data for analysis is planned to be available by July 2005. This will greatly improve our monitoring and evaluation capability. Under examination is the possible use of a web-based tool that would compile the data in a format customized for the purpose of evaluating operations on HOV lanes on I-95/395 corridor.

VDOT expects to use this data reporting to further assess the system's operation and to evaluate and employ future strategies for improved traffic movement. We are also actively looking at private sector partners to assist in the deployment of supplemental ITS solutions to capture additional operational data such as speed, density and volume.

VDOT will also develop a briefing and communication plan regarding HOV operations to apprise FHWA of status of HOV lanes as well as communicate this information to the public. At present, we expect to prepare annual or semi-annual reports.

Action Items Under Consideration

Various mitigation measures were reviewed that have the potential to improve traffic flow on HOV lanes. Action items for consideration to address the degraded capacity on these facilities are listed below. Attached tables 1 and 2 list these proposed items relative pros and cons for each strategy. Upon further evaluation and/or guidance from FHWA, a combination of these could be considered for implementation.

- Enforcement Issues – Consider following recommendations of HOV Enforcement Task Force in addition to actions already taken:
 - Reiterating importance of strict enforcement, especially during first half hour of HOV restriction begin time
 - Determining requirements for further enhancements in enforcement, such as creating HOV enforcement zones

- Allowing the current hybrid exemption to expire in 2006
- Non-Hybrid Vehicle Related Demand Management Measures Examined
 - Changing HOV hours of operations (CTB action required)
 - Evaluate 5:30 AM HOV restriction begin time for northbound travel on weekdays
 - Evaluate 6:30 or 7:00 PM HOV restriction end time for southbound travel on weekdays
 - Installation of dynamic message signs in advance of Horner Road/PW Parkway Ramp merge (also possibly in advance of Newington flyover ramp exit) to advise through traffic to use the lane with less traffic impedance based on real time traffic conditions
 - Ramp metering at ramps that introduce high traffic volumes, such as Horner Road/PW Parkway on-ramp and Route 123 on-ramp, or ramps that infuse concentrated platoons of traffic, such as Franconia-Springfield on-ramp
- Hybrid Vehicle Related Demand Management Measures Examined (General Assembly authorization action required or FHWA rescinding the hybrid “pilot” program before July 1, 2006, when their exemption expires)
 - Changing HOV restrictions on Hybrids
 - Lifting the exemption that allows them to travel as single occupants during HOV restricted periods
 - Allowing hybrid vehicles on HOV lanes only with HOV2+
 - Changing non-HOV3+ Hybrid usage times on HOV lanes
 - Allow single occupant hybrid vehicles on HOV lanes after 7:30 AM for the entire length of the corridor for northbound commute
 - Allow single occupant hybrid vehicles on HOV lanes after 7:30 AM only outside the Beltway
 - Cap the hybrids allowed on HOV lanes at current levels
- Safety-Capacity Improvement/Engineering Measures
 - Coordinate with Pentagon to improve traffic circulation patterns within their parking areas without compromising security needs to alleviate recurring backups on HOV lanes
 - Extension of Deceleration lane at Eads Street exit ramp
 - Extension of Deceleration lane at Newington flyover exit ramp south of the Beltway
 - Extension of Acceleration lane at Horner Road/PW Parkway Ramp merge
 - Use of right shoulder as Bus/Truck climbing lane between Edsall Road and Glebe Road, possibly up to Eads Street
 - Installation of glare screens to reduce rubbernecking delays on HOV lanes -- desirably through the entire length of the corridor; key merge/diverge areas to begin with
- Longer Term Capacity/Supply Side Improvements
 - Additional Lane on HOV facility
 - Prospects of PPTA proposals/HOT lane initiatives
 - Additional Park and Ride lots
 - Additional ramps/access points inside beltway

Next Steps

Multiple opportunities to improve the operation of the I-395 / 95 HOV facility in Northern Virginia exist and have been identified as noted above. The capacity improvements identified can be grouped to near term (3 – 6 months), short term (6 – 12 months), or long term (>12 months). The ‘gap’ between now and month three (3) is intentional and intended to conduct necessary engineering evaluations, and to develop more detailed action plan for these improvements and identify funding for their execution as necessary.

Demand management strategies, especially regarding aggressive enforcement, could produce immediate benefit regarding safe operation, capacity, and flow. Near term (3 –6 months) demand management strategies include extending the time periods for HOV restrictions as noted and should be pursued within VDOT and with the Commonwealth Transportation Board. Short-term (6 – 12 months) demand management strategies should focus on effectively managing hybrid vehicle activity and anticipated growth on the HOV facility. As this study was limited in scope regarding assessing various hybrid scenarios, additional assessment is recommended. It would be expected that other short term capacity and demand management initiatives would provide more effective operation, while the impact of hybrid vehicles is further evaluated.

On-going monitoring and evaluation of the facility operation is essential, and we are planning to have an improved capability to do this on / before July 1, 2005. The improved ability to identify emerging operating issues within the HOV in a more timely manner will allow us to be more proactive in identifying ways to improve operations and implement more timely solutions.

We are also currently working with the private sector to supplement roadway instrumentation and other improved data collection and monitoring capability. Development is expected to continue along and adjacent to the I-395 /95 corridor, potentially taxing the operation of both the HOV facility and general-purpose lanes in the future. Demand management strategies, including ITS deployment, additional incentives for other modes of travel and increased ridesharing will be the critical to maintaining an effective level of operation for the corridor over the short term. Longer-term solutions will most likely need to include possible capacity improvements. However, physical improvements to the corridor are likely to become less of an option going forward due to physical constraints within the existing corridor right-of-way.

Finally, it should be noted that the Pentagon is a significant trip destination (an originator) for vehicles using the HOV facility. The operation of this facility is essential to maintaining the viability and security of the Pentagon workforce. Opportunities have been identified to improve HOV operations in the vicinity of the Pentagon. These suggested improvements will require VDOT to provide information and assistance to the Pentagon.

Once we have further discussed this proposed actions with you and the Commonwealth Transportation Board members and other stakeholders, we will apprise you of the specific actions from the list above that we will pursue. In the meantime, if you have additional questions or suggestions, we welcome the continued dialogue on these issues.

Sincerely,

Philip A. Shucet

cc: Connie Sorrell
Dennis Morrison
State Police
Marc Copeland, DMV

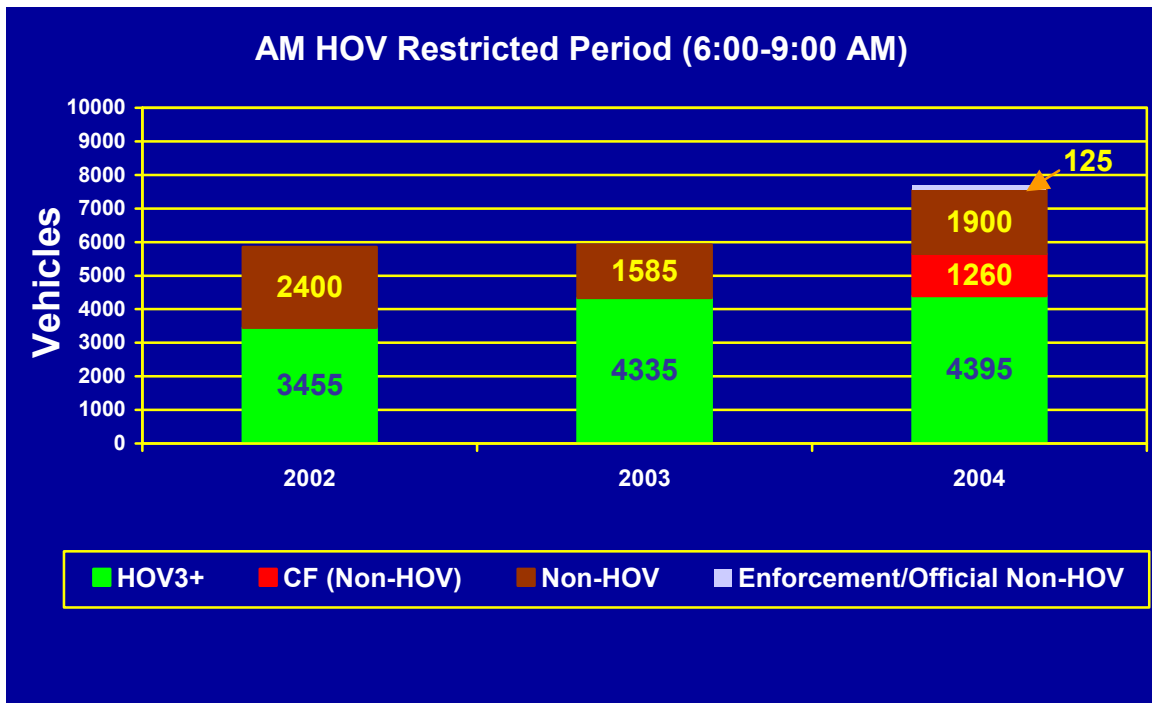


Figure 1. Traffic Volume Growth on I-95 HOV Lanes at Occoquan River

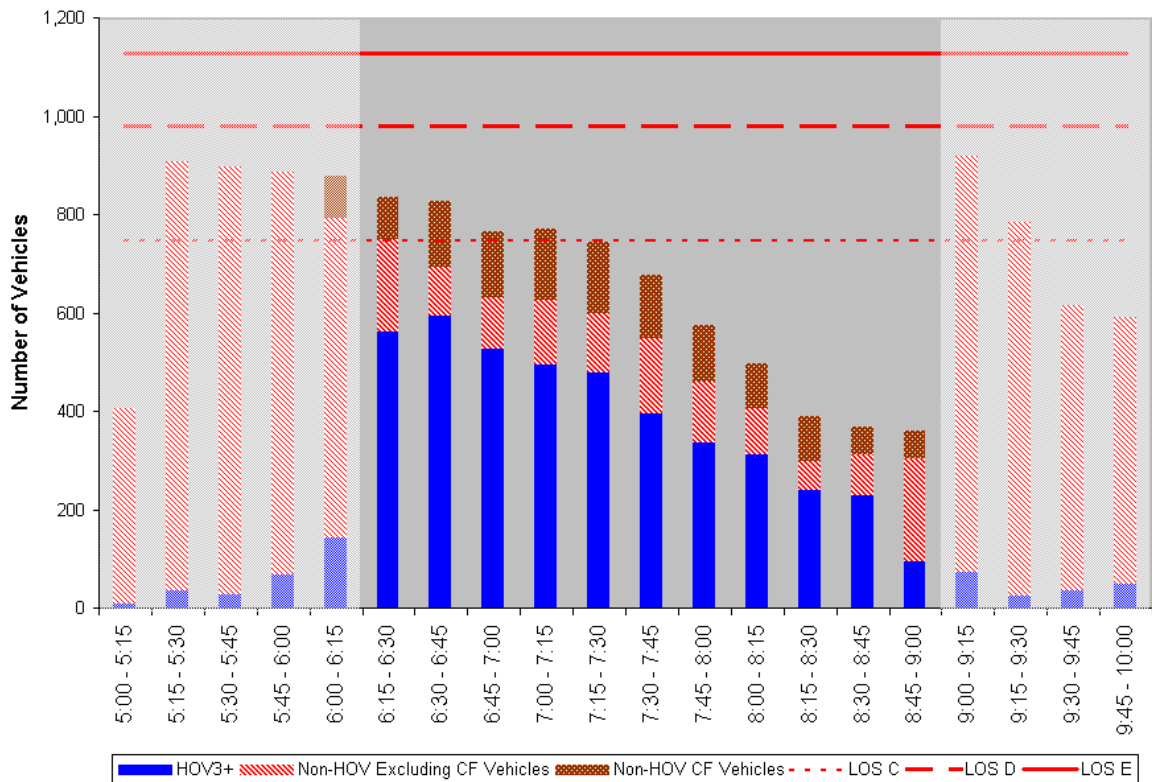


Figure 2. Traffic Volume Distribution on I-95 HOV Lanes At Occoquan River

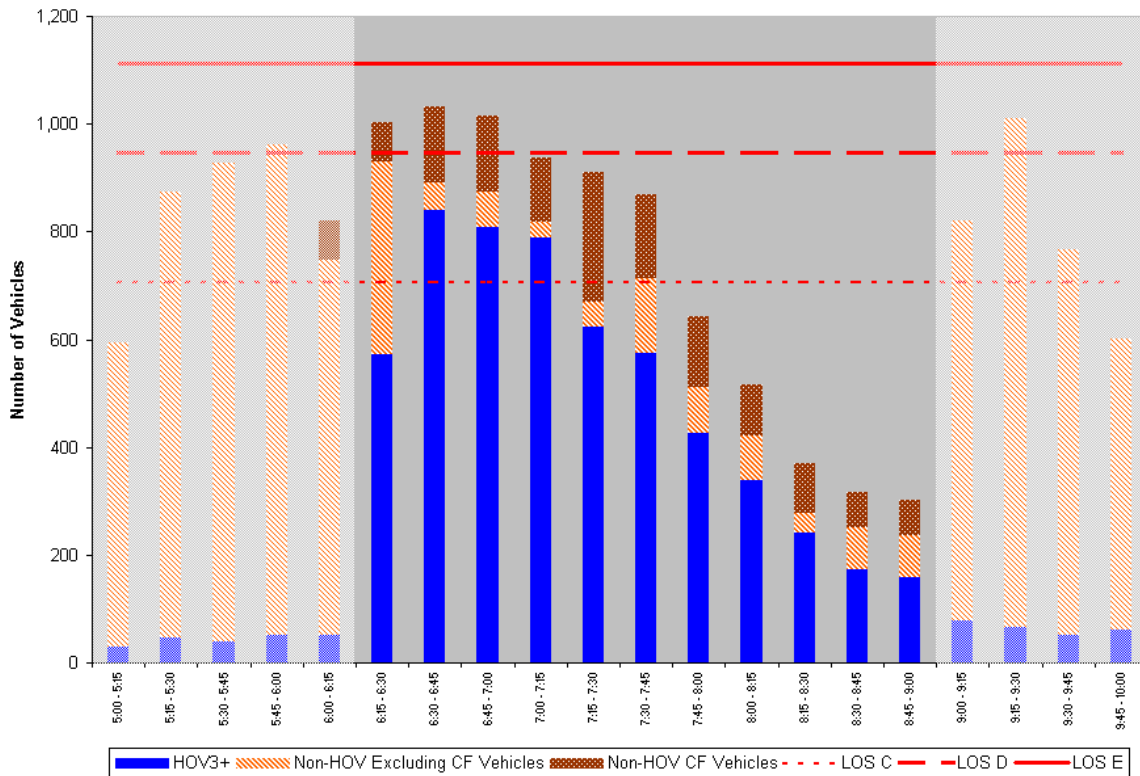


Figure 3. Traffic Volume Distribution on I-95 HOV Lanes At Newington

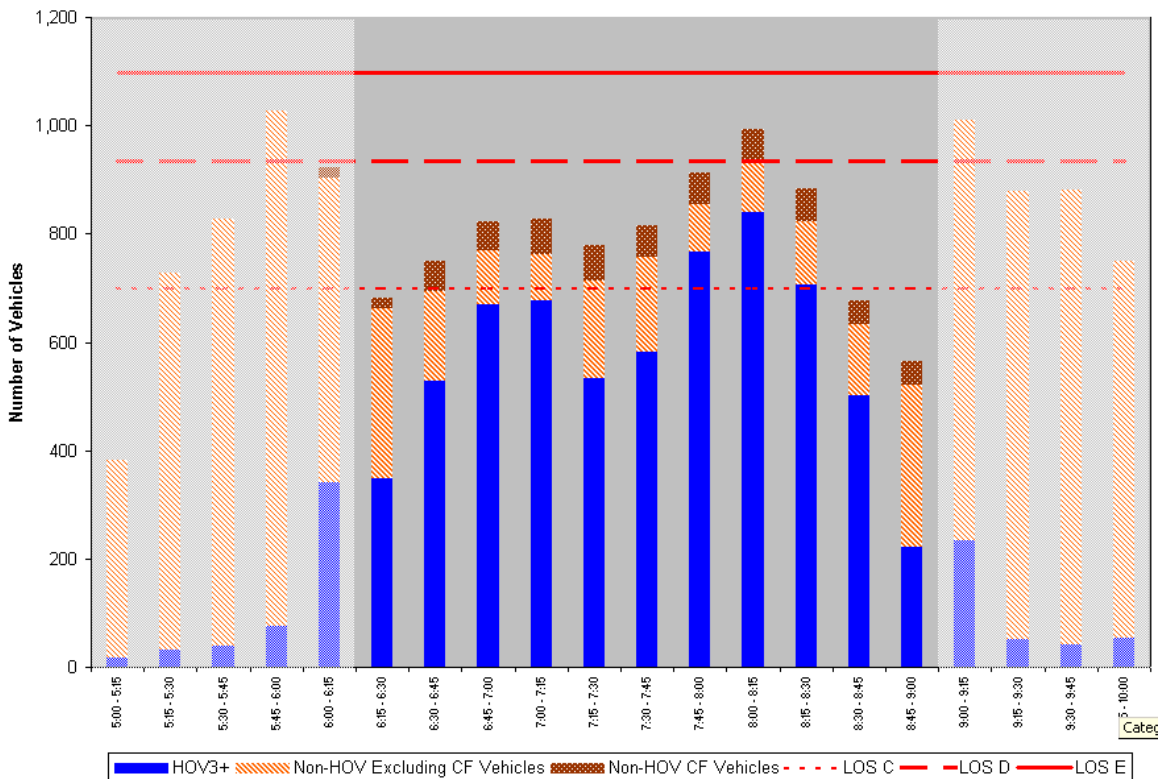


Figure 4. Traffic Volume Distribution on I-395 HOV Lanes At Glebe Road

Table 1. Capacity/Engineering Improvements and Their Impacts

Improvement	Location	Benefits	Challenges	Implementation Difficulties	Time Frame
Glare Screens on Barrier	Preferably entire corridor; Priority to Key Ramp Merge/Diverge Areas	<ul style="list-style-type: none"> • Reduced driver view of general use lane traffic tail lights and incidents • Reduced rubbernecking delays 	<ul style="list-style-type: none"> • Maintenance 	Low	Short Term
Extend Decel Lane to 1500'	NB Exit Ramp to Eads Street	<ul style="list-style-type: none"> • Diverge LOS improves from "D" to "B" • Provides additional stacking area for vehicles queued from the ramp to allow free flow on mainline 	<ul style="list-style-type: none"> • Downstream bottleneck may still constrain ramp capacity • Loss of shoulder for the length of deceleration lane 	Moderate	Short to Medium Term
Extend Decel Lane to 1500'	NB Flyover Exit Ramp to I-95 General Use Lanes (Newington)	<ul style="list-style-type: none"> • Diverge LOS improves from "E" to "C" • Alleviates "shock-wave" backups by exiting vehicles 	<ul style="list-style-type: none"> • Loss of shoulder for the length of deceleration lane 	Moderate	Short to Medium Term
Extend Acceleration Lane Length	NB Ramp Merge from Horner Road P&R Lot/ Prince William Pkwy	<ul style="list-style-type: none"> • Diverge LOS improves from "C" to "B" • Reduces adverse impact of heavy merging activity 	<ul style="list-style-type: none"> • Loss of shoulder for the length of deceleration lane 	Moderate	Short to Medium Term
Shoulder Use By Bus/Truck As Climbing Lane during Peak Periods	NB HOV mainline on I-395 from Edsall Rd to Eads St	<ul style="list-style-type: none"> • Basic Freeway Segment LOS improves from "E" to "D" • Improved queue discharge downstream of bottlenecks, i.e., quicker recovery from stop-and-go on HOV travel lanes 	<ul style="list-style-type: none"> • Probable adverse impacts at intermediate on-ramp locations 	Further Engineering and Cost Analysis Needed	Medium Term
Enhance Traffic Circulation Plan at Pentagon Parking Lots	Eads Street, Pentagon Parking Lots, and NB HOV Exit Ramp Termini	<ul style="list-style-type: none"> • Reduced recurring queue spillback on ramp and I-395 HOV mainline lanes • Enhanced safety due to reduced speed differential caused by slower/stopped traffic on right travel lane 	<ul style="list-style-type: none"> • Coordination with Pentagon and Arlington Co required • Security needs at Pentagon must not be compromised 	High	Medium to Long Term
Reduce Congestion on Washington Blvd.	Washington Blvd; Memorial Circle, and Other Roads on Columbia Island	<ul style="list-style-type: none"> • Reduced Queue of Vehicles Exiting HOV Facility 	<ul style="list-style-type: none"> • Limited opportunities within HOV system • Coordination with NPS required for improvements on roads in Columbia Island 	Very High	Long Term

Table 2. Demand Management Strategies and Their Impacts

Action	Impacts on HOV Lanes	Impacts on General Purpose Lanes
Eliminate HOV3+ Exemption for Hybrid Vehicles	<ul style="list-style-type: none"> • Outside Beltway volumes reduced by 14% to 20%; Will improve traffic flow during peak (6:30-7:30); LOS improve to “C”/“D” • Inside Beltway volumes reduced by about 6%; Will improve traffic flow during peak (7:30–8:30); LOS “D” conditions continue 	<ul style="list-style-type: none"> • Outside Beltway volumes increase by 5% to 10%; Congestion level degrades • Inside Beltway volumes increase by about 3%; LOS “F” conditions continue
Hybrid Vehicles Subject to HOV2+	<ul style="list-style-type: none"> • Outside Beltway volumes reduced by 12% to 15%; Will improve traffic flow during peak (6:30-7:30); LOS improve to “C”/“D” • Inside Beltway volumes reduced by about 5%; Will improve traffic flow during peak (7:30–8:30); LOS “D” conditions continue 	<ul style="list-style-type: none"> • Inside Beltway volumes increase by about 2%; LOS “F” conditions continue • Outside Beltway volumes increase by 5% to 6%; LOS will continue at current levels
Allow Hybrid Vehicle Exemption Between 7:30 to 9:00 AM Only For Entire Corridor	<ul style="list-style-type: none"> • Outside Beltway volumes reduced by about 18% during peak (6:30-7:30) with LOS improving to “C”/“D”; Volumes increase between 7:30 to 8:00 with LOS deteriorating to “D” for brief period • Inside Beltway volumes reduced by about 8% during 6:30-7:30 with LOS improved to “C”; Volumes increase during peak (7:30-8:30) with LOS deteriorating to “E” • Excess capacity outside beltway is better utilized outside beltway after 7:30 AM • May need to consider extending PM HOV restricted period to 6:30 or 7:00 to allow for return commute on HOV lanes 	<ul style="list-style-type: none"> • No significant changes likely to existing volumes and LOS assuming Hybrid vehicles will continue to utilize HOV exemption at different time of day
Allow Hybrid Vehicle Exemption Only Outside Beltway Between 7:30 to 9:00 AM	<ul style="list-style-type: none"> • Outside Beltway volumes reduced by about 18% during peak (6:30-7:30) with LOS improving to “C”/“D”; Volumes increase between 7:30 to 8:00 • Inside Beltway volumes reduced during peak (7:30–8:30) hence improved flow • About 50% of Hybrid users exiting at Beltway will continue to get same benefits 	<ul style="list-style-type: none"> • Inside Beltway volumes will increase after 7:30 AM; Congestion likely to not deteriorate significantly
Cap HOV Exemption to Current Hybrid Vehicle users	<ul style="list-style-type: none"> • Some segments of HOV facility will continue to operate at current levels • In combination with other measures, may work for some more time 	<ul style="list-style-type: none"> • Not likely to have impact to traffic operations on general use lane

Action	Impacts on HOV Lanes	Impacts on General Purpose Lanes
Starting HOV Restricted Period to 5:30 AM for NB Commute	<ul style="list-style-type: none"> • Outside Beltway volumes reduced by 12% to 16%; LOS improved to “C” or “D” • Inside Beltway volumes reduced by 16% to 19% between 6:30 and 7:30 AM; LOS improved to “C” • Will likely improve operations before 6:30 AM by limiting impact of early violators • Strategy may spread the spikes in peak demand volume 	<ul style="list-style-type: none"> • Volumes will remain at existing levels between 6:30 and 7:30 AM but will increase by approximately 500 vehicles between 5:30 and 6:30 AM • Early breakdowns on general purpose lanes may be significant • Extent of mode shift due to increased congestion will need further evaluation
Extending HOV Restricted Period to 6:30 to 7:00 PM for SB Commute	<ul style="list-style-type: none"> • Provides HOV commuters to opportunities to start late in the morning to return late on HOV lanes • In conjunction with additional parking, may help spread AM and PM spikes in peak demand volumes • Will create compatibility in HOV restricted periods between AM and PM—currently 3 hours (6:00-9:00) in AM and 2 ½ hours (3:30-6:00) in the PM 	<ul style="list-style-type: none"> • Need for further evaluation on general purpose lanes • Most likely, no significant impact since traffic into HOV lanes is metered from DC and Potomac River bridge capacities

ATTACHMENT: DMV/DEQ Findings on Hybrids

ATTACHMENT: FROM DMV/DEQ

The Adoption of SULEV Standards & Clean Special Fuel Vehicle License Plates

HOV Enforcement Task Force (Task Force) found that there are rapidly growing numbers of hybrid vehicles being registered with clean special fuel vehicle (CF) license plates in and around the I-95 corridor -- about 97% of the vehicles being registered with CF plates are hybrids. In October 2004, there were approximately 4,800 active CF registrations of hybrid vehicles (97% of all 4,958 active CF registrations) in the Northern Virginia jurisdictions of Alexandria, Fairfax City, Manassas, Manassas Park, Arlington, Fairfax County, Loudoun, Prince William and Stafford. By early February 2005, there were approximately 6,900 active CF registrations of hybrid vehicles (97% of all 7,136 active CF registrations) in those same jurisdictions, a 44% increase (2,100 vehicles) in less than four months.

Hybrids and other qualifying vehicles registered with CF license plates are currently exempt from HOV occupancy requirements until July 1, 2006¹. As such, their exempt use of the HOV lanes was found to exert a negative impact on those facilities in the northern Virginia region. In addition, many of the upcoming hybrid models have not been designed for better fuel efficiency or significantly lower emissions.

In response to these findings, the Task Force discussed with the Department of Environmental Quality (DEQ) ways to modify its assessment standards for determining which vehicles qualify for CF license plates. These discussions focused on ensuring only the cleanest of hybrids -- those that meet California's super ultra-low emission vehicle (SULEV) emission rating, or EPA's equivalent emission rating -- would qualify for CF license plates.

The SULEV assessment standard was adopted by DEQ just prior to the completion of the Task Force report, which recommends its adoption. In order to avoid recalling CF license plates already issued and any unreasonable disruption of existing dealer inventories, all new hybrid vehicles beginning with model year 2005 and later will be subject to the SULEV assessment standard.

Based on the SULEV assessment standard, only the new 2005 Ford Escape Hybrid currently qualifies for the CF plate in Virginia. Based on previous determinations, the Honda Civic Hybrid, the Honda Insight and the Toyota Prius will continue to qualify for the CF plates.

Other new hybrid vehicles will be evaluated as they come on the market and added to the list if they meet the SULEV standards. For example, the 2005 Honda Accord Hybrid only meets the ultra low emission vehicle (ULEV) standard and is therefore not eligible for the CF plate.

The Department of Motor Vehicles (DMV) has been and will continue to work with DEQ, VDOT and the motor vehicle dealer community to ensure that qualifying vehicles are properly identified and that the public is able to obtain accurate information about them.

¹ Under the Code of Virginia, this exemption will end anytime prior to July 1, 2006, if and when the Governor receives a written statement from the Federal Highway Administration indicating the statute contravenes federal law.